TCEQ Proposed Plan Comments

2.3.1 Comment: It is unclear if groundwater beneath the waste impoundments is protective of the Texas Surface Water Quality Standard (TSWQS) of 7.97E-8 ug/L for dioxins/furans (TCDD equivalents) as the detected concentrations in groundwater beneath the northern and southern impoundments was reported to be 2.64E-6 ug/L and 60.2E-6 u/L respectively. Additionally, the TSWQS for dioxins/furans (TCDD equivalents) is based on the total concentration of dioxins/furans in water. Total dioxins/furans concentrations include both dissolved and suspended dioxins/furans. Due to their hydrophobicity, low solubility, and low volatility, dioxins/furans in groundwater are expected to preferentially partition to suspended solids, including colloidal particles. The analytical results reported in the September 2016 Data Summary Report for samples collected using a solid phase micro extraction method only represents the concentrations of dissolved dioxins/furans and cannot be used to demonstrate compliance with TSWQS.

Response: *Removal of the dioxin waste will remove the source of dioxin contamination to ground water, while capping the waste will leave the source material in place. The sampling and analysis methods will be determined during the remedial design/long-term monitoring phase of the project. Both the total and dissolved fraction will be evaluated. The concentration of TCDD equivalents is not necessarily a direct correlation to surface water concentrations because surface water concentrations are impacted by other factors in addition to the ground water conditions. It is anticipated that the selected alternative would reduce dioxin/furan concentrations in groundwater directly below the impoundments due to removal of the source.*

2.3.2 Comment: It is unclear what the scientific/risk assessment basis is for the calculation of the Principal Threat Waste value, as well as what it means for site cleanup at this site. The Principal Threat Waste cleanup value is described as being calculated by multiplying the sediment Preliminary Remediation Goal (PRG) of 30 ng/kg by a factor of 10. However, there is no explanation of the reasoning behind the factor of 10. EPA should provide the scientific/risk assessment basis for calculation of the principal threat waste value. EPA should also explain how principal threat waste is to be used in the context of the other calculated PRGs for the site.

Response: *The purpose of discussing Principal Threat Waste is not to set cleanup levels. The purpose is to reflect EPA's belief that certain source materials are addressed best through treatment because of technical limitations to the long-term reliability of containment technologies, or the serious consequences of exposure should a release occur. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur. They include liquids and other highly mobile materials (e.g., solvents) or materials having high concentrations of toxic compounds. No "threshold level" of toxicity/risk has been established to equate to "principal threat." However, where toxicity and mobility of source material combine to pose a potential risk of* 10^{-3} *("A Guide to Principal Threat and Low Level Threat Wastes", Superfund Publication: 9380.3-06FS November 1991) or greater, generally treatment alternatives should be evaluated. EPA policy sets a precedent for defining principal threat waste based on a multiple of a risk based level. For example, waste demonstrating a carcinogenic risk of* 10^{-3}*. which is 10 times higher than the upper end of the*

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acceptable risk of 10^{-4}, is considered a principal threat. Based on this precedent, the PRG of 30 ng/kg based on non-carcinogenic was multiplied by 10. Using a factor of 10 ensures that the waste could be released over the area of exposure with only limited dilution without causing exceedance of risk levels. The basis for the Principal Threat Waste value is included in the Record of Decision.

2.3.3 Comment: Ultimately, the goal is removal of the fishing advisory in the area. The Toxicity Equivalency Quotient (TEQ) fish tissue Health Assessment Comparison (HAG) of 2.33 ng/kg is the value DSHS uses for dioxin fishing advisories. In review of EPA's August 29, 2016, Memorandum, "Human Health Risk Evaluation and Recommended Sediment Cleanup Level for Site Specific Exposure to Sediment at the San Jacinto River Superfund Site," the calculation of the sediment PRG of 30 ng/kg for dioxin is somewhat explained. EPA calculated PRGs individually for sediment ingestion, dermal exposure to sediment, and fish/shellfish ingestion, as well as a sediment PRG for fish consumption. EPA then calculated a total PRG associated with a hazard index of 1 from exposure to sediment through the ingestion of sediment, dermal contact with the sediment, ingestion of finfish, and ingestion of shellfish. The total sediment PRG is calculated to be 28.9 ng/kg, which EPA then rounds to 30 ng/kg. However, EPA does not provide the calculation for this PRG, so it is unknown how this final value was calculated from the individual PRGs.

Exposure Pathway	Calculated Non-Cancer PRG
Sediment ingestion	7.86E-4 mg/kg = 786 ng/kg
Dermal exposure to sediment	2.77E-4 mg/kg = 277 ng/kg
Fish tissue ingestion	3.13E-6 mg/kg = 3.13 ng/kg
Shellfish ingestion	7.3E-5 mg/kg = 73 ng/kg
Total sediment: ingestion, dermal, ingestion offish/shellfish	30 ng/kg (rounded up)
Sediment-to-fish consumption	35 ng/kg

The fish tissue PRG EPA calculated, which is used in the calculation of the total sediment PRG, is 3.1E-6 mg/kg, or 3.1 ng/kg. This fish tissue PRG is 1:33 fold higher than the DSHS dioxin fish tissue HAC of 2.33 ng/kg. Similarly, EPA uses the fish tissue PRG in the calculation of the sediment-to-fish consumption PRG of 35 ng/kg. By using a fish tissue PRG 1.33 fold higher than the DSHS dioxin fish tissue HAC, the resulting total sediment PRG and sediment-to-fish consumption PRG are higher than what would be needed to address the site's contribution to the fishing advisory. In order to sufficiently address the site's ongoing contribution to the fishing advisory in the area, the DSHS fish tissue HAC value for dioxin should be used. The TCEQ does not support actions/remedies that do not fully address the ultimate goal of allowing the removal of fishing advisories by DSHS (e.g., DSHS uses a Toxicity Equivalency Quotient fish tissue HAC of 2.33 ng/kg based on a hazard quotient of 1.)

Response: *One of the Remedial Action Objectives for the remedial action at the Site is to reduce human exposure to dioxins from consumption of fish. While the Site is a significant source of dioxin, it is not the only dioxin or PCB source (TMDL, Univ of Houston, 2006 & 2009), both of which contribute to the fish advisory. Because remediation of the Site will not* *affect the other sources in the San Jacinto River it cannot be expected that the fish advisories are likely to be removed.*

Development of the PRGs for the Site is described in the Record of Decision. Based upon the factor of 1.33 difference between the DSHS HAC and the EPA calculated PRG, both fish tissue concentrations would essentially result in a non-cancer hazard of 1, assuming only one significant figure (EPA 1989). The EPA calculated fish tissue PRG would not result in an unreasonable high sediment PRG. The selected sediment PRG is based upon the cumulative risk effects of ingestion, dermal contact, and ingestion of fish. BSAFs can vary quite significantly across the Site. Therefore, the 1.33 higher factor for EPA calculated fish tissue PRG is reasonable given the inherent uncertainty in the risk assessment process (e.g., fish ingestion rates, exposure durations, toxicity values).

2.3.4 Comment: The TCEQ requests that the EPA to annotate the tables provided under Human Health Risks section on pages 17 and 18 to include the meaning of the numbers in bold font. One might assume the bold is highlighting the numbers above the Hazard Index of 1, except that 0.11 is bold under the last entry for Scenario DS-5 in the table on page 18.

Response: *The Record of Decision will include the following corrections: the table on page 18 will be revised to remove the bold font for the HQ=-.11. A footnote will be added to denote the bold font identifies those exposure pathways with non-cancer hazards greater than the acceptable level of 1.*

2.3.5 Comment: Based on the Proposed Plan, it does not appear that EPA is planning to address the sediment areas outside the armored cap with dioxins/furans concentrations greater than the PRG of 30 ng/kg. Regarding the sediment cleanup areas, the following statement is made on Page 20. For the river areas outside of the armored cap, the surface area-weighted average dioxin concentration in sediment located just south of the waste pits (Figure 11) is 16.1 ng/kg, and the surface area-weighted average dioxin concentration in sediment in areas located adjacent to and upstream of the waste pits is 11.2 ng/kg. Because the average dioxin concentrations in sediment both upstream and downstream of the waste pits are less than the 30 ng/kg Preliminary Remediation Goal [PRG] for sediment, remediation of the sediment is not required. This seems in contrast with Figure 9, which shows surface sediment areas with concentrations greater than the 30 ng/kg PRG outside the armored cap. Also, Figure 11 seems to be referring to fish collection areas and tissue sampling transects and not the sediment. If the EPA is not planning to address areas with dioxins/furans concentration above 30 ng/kg outside the armored cap, please explain the rationale for this decision.

Response: *The rationale for not remediating areas outside the armored cap is explained in the Record of Decision. The PRG for sediment is based upon risk concerns. These risk concerns are evaluated over the Site as enumerated in the exposure point concentration (EPA 1989). Figure 9 in the Proposed Plan does show some sediment areas that are greater than the PRG of 30 ng/kg, however, when considering the overall Site, the sediment concentration, at 16.1 ng/kg, is significantly less than the PRG at 30 ng/kg. The assessment of the weighted average sediment concentration outside the armored cap is reasonable and consistent with the risk assessment. Notwithstanding the previous statements, the sediment in the Sand Separation*

Area will be addressed with Monitored Natural Attenuation as discussed in the Record of Decision.

2.3.6 Comment: The abbreviation PRG was used in the document, but was not associated with the term "preliminary remediation goal."

Response: *Noted. The ROD will include a list of acronyms and their definitions, including the acronym "PRG" for "Preliminary Remediation Goal".*

2.3.7 Comment: EPA chose dredging of the northern disposal site. In doing so, however, EPA did not consider the "short-term potential for adverse health effects from human exposure" and "the potential threat to human health and the environment associated with excavation, transportation, and redisposal" 42 U.S.G. § 9621(b)(1)(D), (G). The US Army Corps of Engineers specifically found that EPA's preferred dredging remedy (namely, alternative 6N) "would be expected to significantly increase short-term exposures to contaminants." Feasibility Study App. A Section 5 and the US Army Corps of Engineers specifically found that dredging under alternative 6N would have dramatically worse short-term impacts than the capping remedies. EPA failed to provide a reasoned justification for rejecting the USAGE analysis.

Response: *The US Army Corps of Engineers evaluation documents trade-offs between the long-term and short-term risks of release, both of which are dependent upon the effectiveness of engineering controls. The ability of Alternative 6N to control release is reliant on the ability of best management practices to control resuspension of sediments during removal. The Corps of Engineers Report, the Feasibility Study, and the Proposed Plan envisioned a removal based on a combination of excavation in the "dry", dredging behind a sheetpile wall, and dredging behind a silt curtain in the deeper water area at the northern part of the waste pits. However, based on consideration of the public comments received, and assessing the possibilities of performing the removal completely in the "dry", the selected remedy described in the Record of Decision consists of a cofferdam installation with excavation of the waste pits solely in the "dry", without any dredging. Therefore, the selected remedy will not result in a significant increase in short-term exposures as may result from underwater dredging. In contrast, a release under extreme conditions for the current TCRA-cap as modeled by the U.S. Army Corps of Engineers is 170 grams; this gives an indication of what a catastrophic event could release under a capping scenario. As such, the selected remedy provides a more certain, quantifiable outcome than Alternative 3N, with a lower overall potential for release of mass. Add 3aN model EPA maintains that the use of an armored cap will be inadequate to contain the pulp waste over the long-term.*

2.3.8 Comment: The EPA indicated that the analytical results for dioxins/furans at the sand separation area may not be representative of the concentrations in that area and concluded that additional sampling may be necessary to obtain representative data. The TCEQ agrees with the EPA's conclusion and suggests collection of additional samples in the sand separation area, prior to issuance of the ROD.

Response: *Two samples over 300 ng/kg were found in the Sand Separation Area, but based on other samples the EPA does not believe these two results are representative of the area.*

The Sand Separation Area will be sampled during the Remedial Design to confirm the current sediment dioxin level and to establish a baseline for the Monitored Natural Recovery there. It is not appropriate to further delay the Site cleanup, as would occur if additional sampling was performed before selection of the Site remedy in the Record of Decision, given that the average dioxin level in the Site sediment, which is 16.9 ng/kg, does not exceed the cleanup level of 30 ng/kg.

2.4.1 Comment: A commenter questioned the EPA's use of a 7% discount rate using a 30-year timeframe. Commenter feels using a 4% discount rate with 2% inflation is more appropriate.

Response: *The net present value (NPV) analysis is a method to evaluate expenditures, either capital or O&M, which occur over different time periods. This standard methodology allows for cost comparisons of different remedial alternatives on the basis of a single cost figure for each alternative. Since the NPV analysis is being used to compare different alternatives the use of a 7% discount rate using a 30-year timeframe is appropriate. If EPA were establishing the amount of financial assurance that a PRP would need to hold, then EPA would evaluate the discount rate and timeframe. EPA utilized the policy on the use of discounted rates for Remedial Investigation/Feasibility Study costs analyses as stated in the preamble to the NCP (55 FR 8722) and in Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-20 entitled "Revisions to OMB Circular A-94 on Guidelines and Discount Rates for Benefit-Cost Analysis" (USEPA 1993). Based on the NCP and this directive, a discount rate of seven percent should be used in developing present value cost estimates for remedial action alternatives during the Feasibility Study. The 7% discount rate is based on un-inflated costs. Therefore, this rate should be used with "constant" or "real" dollars that have not been adjusted for inflation (i.e., a dollar spent in future years is worth the same as a dollar spent in the present year), which is the typical situation for Remedial Investigation/Feasibility Study cost analyses.*

2.4.2 Comment: EPA also failed to explain the cost-effectiveness of its preferred dredging remedies. Among other things, CERCLA requires EPA to "select a remedial action ... that is cost effective." 42 U.S.G. § 9621(b)(1). EPA chose the most-expensive of the proposed remedies because, in EPA's view, they are superior to the alternatives. But the question is not whether alternatives 6N and 4S are better than the alternatives; the question is whether EPA can explain how those remedies are more cost-effective—that is, whether and to what extent they are so far superior to the alternatives that they warrant exponential increases in the cost of the remedial order. EPA should further consider the cost-effectiveness of the proposed remedy, and explain its choice in light of CERCLA's cost-effectiveness mandate.

Response: *During the remedy selection process, nine evaluation criteria are considered in distinct groups which play specific roles in working toward the selection of a remedy that satisfies the following five principal statutory requirements:*

1) *Protect human health and the environment;*
2) *Comply with applicable or relevant and appropriate requirements (ARARs) unless a waiver is justified;*
3) *Be cost-effective;*

4) *Utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and*
5) *Satisfy a preference for treatment as a principal element, or provide an explanation in the Record of Decision (ROD) why the preference was not met.*

The nine evaluation criteria include two "threshold" criteria, five "balancing" criteria (including cost), and two "modifying" criteria (state and community acceptance). The alternatives are also separately evaluated against a subset of the criteria to make the determination of which option(s) satisfy the statutory cost-effectiveness. A remedial alternative is cost-effective if its "costs are proportional to its overall effectiveness" (40 CFR 300.430(f)(1)(ii)(D)). Overall effectiveness of a remedial alternative is determined by evaluating the following three of the five balancing criteria: long-term effectiveness and permanence; reduction in toxicity, mobility and volume (TMV) through treatment; and short-term effectiveness. Overall effectiveness is then compared to cost to determine whether the remedy is cost-effective. As discussed below, EPA did not merely "chose the most-expensive of the proposed remedies".

When developing the costs of the alternatives presented in the Proposed Plan, EPA utilized the policy on the use of discounted rates for Remedial Investigation/Feasibility Study costs analyses as stated in the preamble to the NCP (55 FR 8722) and in Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-20 entitled "Revisions to OMB Circular A-94 on Guidelines and Discount Rates for Benefit-Cost Analysis" (USEPA 1993). Based on the NCP and this directive, a discount rate of seven percent was used in developing present value cost estimates for remedial action alternatives during the Feasibility Study. The 7% discount rate is based on un-inflated costs. Therefore, this rate should be used with "constant" or "real" dollars that have not been adjusted for inflation (i.e., a dollar spent in future years is worth the same as a dollar spent in the present year), which is the typical situation for Remedial Investigation/Feasibility Study cost analyses.

*To better explain the cost-effectiveness of the preferred alternative, EPA utilized the guidance document entitled "A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" (*EPA 540-R-00-002 OSWER 9355.0-75 July 2000*). The guidance document, which was jointly developed by EPA and USACE, provides a detailed discussion on conducting the net present value (NPV) assessment. A NPV analysis of a remedial alternative involves four basic steps:*

1. *Define the period of analysis.*
2. *Calculate the cash outflows (payments) for each year of the project.*
3. *Select a discount rate to use in the present value calculation.*
4. *Calculate the present value.*

To more appropriately evaluate the cost effectiveness of Alternatives 3aN and 6N, EPA updated the NPV analysis by adjusting the period of analysis, the cash outflows for each year of the project and the discount rate.

Alternative 3aN:

Period of Analysis and Cash Outflows: *The FS assumed only 2 years of O&M would occur in the first two years of the project. The current cap has required repairs in the 6 years following completion due to riverbed erosion. To more accurately assess the cost of Alternative 3aN, EPA used a project life of 100 years with annual O&M costs of $100,000 per year. The use of an annual operation and maintenance cost, as opposed to only the first two years as was done in the Feasibility Study, allows a more appropriate assessment of the costs associated with cap repairs in the 6 years following completion of the cap, and also includes a provision for future repairs that may be necessary following severe storm events.*

Discount Rate: *The FS cost estimate employed a 7% discount rate for future year costs applied to baseline year costs (un-escalated) in accordance with EPA policy so that the costs for various alternatives can be compared on an equitable basis. However, according to the current Office of Management and Budget (OMB) "2017 Discount Rates for OMB Circular No. A-94, Appendix C", dated December 12, 2016, the relevant discount rate is 0.7% for projects of 30 years or longer and for constant-dollar flows (inflation premium removed). The impact of using a 7% discount rate compared to a 0.7% discount rate is that future year costs have an increasingly reduced impact on total project costs so that costs in later years, and especially beyond 30 years, have essentially no material impact on total project costs.*

NPV Calculation: *Using the 100-year project life, annual O&M costs of $100,000 per year and a discount rate of 0.7%, the NPV of Alternative 3aN is $80 million.*

<u>Alternative 6N:</u>

Period of Analysis and Cash Outflows: *the cost estimate has been modified somewhat in response to the public comments, namely to employ the use of a cofferdam and perform the excavation in the "dry" so that no material release is expected during the removal.*

Discount Rate: *As discussed above, the NPV for Alternative 6N was calculated using a discount rate of 0.7%*

NPV Calculation: *Using the 100-year project life, additional capital cost for a coffer dam, and a discount rate of 0.7%, the NPV of Alternative 6N is $105 million.*

Therefore, comparing the costs for Alternatives 3aN and 6N, Alternative 6N is approximately $25 million, or 31%, higher total cost than Alternative 3aN.

The enhanced capping of the waste may be less expensive and less disruptive to the community, but results in a lower level protection to human health and the environment for the long-term. If the cap fails or if effective maintenance is not sustained over the future centuries during which severe or extreme storm events are expected, the impact will be detrimental.

Removal will eliminate the potential for the costs associated with cleaning up a large contaminated sediment site that may result from a catastrophic failure of a cap, and will eliminate the potential for future environmental and human health impacts should a release occur. The cost of a future widespread sediment cleanup, as well as health impacts, resulting *from a cap failure are related to the amount of material that would be released in a future hurricane or hurricanes, which is impossible to predict with any degree of certainty. However, the history of the need for repeated cap repairs, the exposure of waste materials, the riverbed erosion that occurred adjacent to the cap, all of which occurred during storms with much less intensity that the hurricanes to which the area is prone, do not support capping as a cost-effective remedy. The Selected Remedy, removal, is protective of human health and the environment, complies with applicable, relevant, and appropriate requirements, and provides the best balance of tradeoffs among the balancing criteria. It reduces risks within a reasonable time frame, provides for long-term reliability of the remedy, and minimizes reliance on institutional controls. It will achieve substantial risk reduction by removing the contaminated materials unlike capping, which would always be susceptible to a future release following a severe storm event, or due to a failure of maintenance over a period of centuries.*

2.5.1 Comment: The US Army Corps of Engineers found that capping would be permanent and effective at containing pollutants at the northern disposal site. EPA rejected the USACE conclusions because it is possible that (a) the cap could be damaged by a barge strike, (b) the cap could be damaged by "extreme weather events," and (c) climate change and sea-level rise is likely to make future weather events even more severe and frequent. As to EPA's first reason, the US Army Corps of Engineers found that "[a] major barge strike, which would be predicted to occur once in 400 years, would impact less than 1% of the cap area and potentially release less than 0.1% of the contaminated sediment, which is less than 25% of the releases predicted for [EPA's preferred removal remedy]." (Feasibility Study App. A at 3.) And the US Army Corps of Engineers noted that the risks of a barge strike could be all but eliminated by reinforcing and protecting the cap. See id. at 60-69. EPA did not provide a reasoned basis for rejecting the US Army Corps of Engineers findings, given that (1) major barge strikes happen once every 400 years, (2) even a major barge strike would affect less than 1% of the cap, (3) the toxins released by even a major barge strike would pale in comparison to the toxins released by EPA's chosen dredging remedy, and (4) capping (even when reinforced to all but eliminate the risks of barge strikes) is dramatically cheaper than EPA's preferred removal remedy.

Response: *The EPA utilized the U.S. Corps of Engineers' results, among other factors, to develop the selected remedy for the Site. To clarify the Corps of Engineers' conclusions, the Corp's report, on page 2, under "Permanence of Capping", states "The evaluations performed to address the permanence of the existing repaired TCRA cap with the proposed modifications outlined in the capping Alternative 3N showed that the cap is expected to be generally resistant to erosion except for very extreme hydrologic events, which could erode a sizable portion of the cap." The Corps model simulations of a severe storm also found that "Approximately 80 percent (12.5 acres) of the 15.7 acre TCRA cap incurred severe erosion during the simulated extreme (hypothetical) storm. The maximum scour depth in any grid cell within the cap boundary during this hypothetical extreme event was 2.4 ft (0.73 m). Replacement of the armor materials with a median size of at least D50 = 12 inches would be needed to greatly reduce the amount of scour that occurs during such an extreme event." The Corps of Engineers performed more recent model simulations to investigate the performance of the upgraded cap as requested by commenters. The upgraded cap simulated was the cap described under Alternative 3aN using the same storm conditions. The Corps found that add 3aN model result*

While there are concerns related to barge strikes, as noted in the comment, the impact of potential barge strikes could be mitigated with protective pilings and a thickened cap as was included in the enhanced capping alternative 3aN. However, these protective measures do not result in adequate long-term protection from the impacts of extreme weather events (i.e., severe hurricanes or 500-year rainfall events).

2.5.2 Comment: EPA's reasons for rejecting the capping remedy are untenable. EPA found that, "based on the Corps of Engineers review (Appendix A of the Feasibility Study), a severe future storm could result in significant erosion of 80% of the armor cap and up to 2.4 feet of scour into the waste pits." (Proposed Plan page 32.) But that finding is based on the US Army Corps of Engineers review of only one of the capping alternatives (namely, alternative 3N). The US Army Corps of Engineers specifically recommended additional changes to the capping remedy (such as alternative 3aN) that would not suffer 80% erosion or 2.4 feet of scour in even the most severe and anomalous weather events. EPA's only response is to speculate that it is theoretically conceivable that there are still more severe weather events that no one could foresee, that the US Army Corps of Engineers did not model, and that could theoretically damage even the enhanced and armored cap. EPA does not even attempt to explain, quantify, or justify that speculation. If it were true that EPA could reject any remedy where there is any risk in it— however infinitesimally small, however ill-defined, and however speculative—then EPA could reject any remedy it wanted.

Response: *EPA disagrees that the reasons for rejecting an upgraded cap are untenable. The primary upgrades for the cap under Alternative 3aN were to add barriers to prevent barge strikes along with an additional 24 inches of armor stone over the armor cap recommended for Alternative 3N. Several reasons are stated in the Feasibility Study for concern regarding these alternatives. The additional armoring for 3aN still does not address the issue regarding stream bed stability. Furthermore, the Feasibility Study indicates that the additional weight of the armor stone may push waste out of the sides of the cap. This would cause uncontrolled releases of contaminants. Even though Alternative 3aN consists of an upgraded cap, it is still subject to the uncertainties of severe floods, a dynamic river, and adequate maintenance over the centuries that the waste will remain toxic. The removal of the waste material will provide a long-term solution to protect the community, eliminate the potential for a catastrophic release to the environment, and prevent the Site from becoming a large contaminated sediment site. Add USACE 3aN model results.*

2.5.3 Comment: The preferred remedial alternatives for the northern impoundments (alternative 6N) and the southern impoundment (alternative 4S) involve dewatering of the sediment and soil column. The Proposed Plan did not provide information on wastewater management. The TCEQ requests preliminary wastewater management information such as the contaminants of concern (COCs) to be monitored, threshold COC concentrations in the wastewater prior to disposal, and the method and location of the wastewater disposal. Even though details are expected during the remedial design phase, the TCEQ would like preliminary wastewater management information prior to issuance of the record of decision (ROD). Typically, total suspended solids (TSS) concentrations in the decant water from dredging activities must not exceed 300 mg/L. In addition, if the decant water is diverted back to the river, the COC concentrations in the water must be protective of TSWQS. The diverted water must be treated, if necessary.

Response: *The selected remedy must comply with Applicable or Relevant and Appropriate Requirements (ARARs). Best Management Practices (BMPs) will be incorporated into the Remedial Design as necessary to support water quality and attainable use standards for this section of the San Jacinto River. On-site water discharges will comply with the substantive technical requirements of the Clean Water Act, but do not require a permit. EPA will work with TCEQ during remedial design to determine the substantive requirements for the Clean Water Act. During a pre-design phase, it is anticipated that collection of samples from the target material would be obtained and analyses such as porewater concentrations would be performed to identify the concentrations of the COCs, which were identified in the risk assessment conducted at the Site, in the untreated discharge wastewater and that based on those results an adequate water treatment system would be designed.*

2.5.4 Comment: Based on the excavation volumes and the number of truck trips projected for remedial alternative 6N, it appears that the EPA is considering the use of 12-cubic yard trucks for the transportation of waste material. The TCEQ suggests the use of larger trucks, if feasible, to reduce the number of truck trips. The TCEQ also suggests that truck routes be determined prior to issuance of the ROD, to identify the neighborhoods impacted by the removal actions, if any.

Response: *The use of larger vehicles may be feasible considering that access to I-10 is only about 1½ miles from the site via the East Freeway Service Road, which is primarily used for non-residential, commercial/industrial traffic and trucking. Transportation of the removed material will be determined as a part of the Remedial Design. The design will consider equipment availability, decontamination requirements, road conditions, site trafficability, access and staging requirements, as well as other factors. If transport is performed by trucks, some road improvements and repair will probably need to be considered in the Remedial Design. The design will evaluate truck routes in an effort to minimize impacts on the local communities. During the design phase, the location of treatment facilities (if necessary) and disposal facilities will be reviewed and selected along with acceptable truck routes. Transportation details is a normal design issue that will be addressed during the Remedial Design.*

2.5.5 Comment: For the preferred remedial alternatives 6N and 4S, the EPA did not specify the location for staging and possible stabilization for the excavated sediment and soil prior to their final disposal. Please provide this preliminary information along with the final disposal facility name and location prior to issuance of the ROD.

Response: *The items requested are normally established during the design phase. Materials disposed in a landfill are required to pass the paint filter test. Mechanically excavated sediments often pass the paint filter test without adding stabilizing agents; however, if stabilizing agents are needed, they may be added in a staging area within the site without the need of a separate off-site staging area. The waste materials and stabilizing agents can be mixed as they are loaded onto trucks for transport to disposal. Identification of staging areas and final disposal sites will be performed during the Remedial Design. The selected remedy includes* *completely enclosing the capped area within a cofferdam for removal. This approach will modify the sediment treatment and handling requirements compared to dredging prior to disposal. A thorough assessment of handling, treating, storing, and transporting will be performed during the design phase.*

2.5.6 Comment: Under remedial Alternative 6N, it is not clear if the excavated areas would be backfilled prior to placement of the residual management layer of clean cover; we request clarification. The USAGE report specified three methods of backfill placement – dump placement, rain placement, and best practice placement. We request information on the placement method selected by the EPA and the rationale for the selection, prior to issuance of the ROD.

Response: *The remedial goal for the waste pits area is 30 ng/kg for dioxins with the excavation being accomplished in the "dry" behind a cofferdam. It is not anticipated that a backfill or cover layer will be required as was the case with the former 200 ng/kg remedial goal because all of the waste will be removed. However, the cofferdam fill materials (sand or dredged material from outside of the waste pits) may be distributed across the site upon completion and removal of the cofferdam.*

2.5.7 Comment: Estimated construction time for remedial Alternative 6N is 19 months. That appears to be a radical under-estimate of the true construction time. And if EPA has underestimated the construction time of Alternative 6N, it will make that remedy even less cost-effective than it otherwise appears. The TCEQ requests the EPA explain how this construction time is estimated.

- Does the construction period include the time required for best management practice (BMPs) installations prior to the commencement of work?
- Is the construction expected to occur on a 7-days per week schedule or a 5-day per week?
- How many work shifts are estimated and what are the durations of shifts?
- Were allowances made for stoppage of work during hurricane season, storms, etc.? If so, what are the allowances?

Response: *The construction time estimate for the Alternative 6N presented in the Proposed Plan and the Feasibility Study. However, with the adoption of excavation in the "dry" behind a cofferdam, the construction times have increased based on input from the U.S. Corps of Engineers. Further, the construction time estimate will be reviewed during the design phase and updated as appropriate as the more detailed design is developed. The construction time for the selected remedy is currently 27 months. The total time required for construction is equal to the time required to install the cofferdam (19.3 months), to complete removal activities (4.3 months), and to dismantle the cofferdam (3.3 months), assuming 10-hour work days and 6-day work weeks.*

There are many project case histories which demonstrate that the former 19-month schedule is within reason. One example is the Sheboygan Harbor Sediment Dredging project. This project occurred in upstate Wisconsin. Dredging of 170,000 cubic yards of PCB contaminated sediment was completed in 8 months. The construction season in upper Wisconsin is drastically affected by cold weather. Clearly a construction schedule of 19 months falls within the realm of reason.

But as with any construction project there are always conditions that are not anticipated, which require schedule adjustments. A second example is provided by Ashtabula Sediment Removal. Construction funding for the project was received in December 2005. In late May 2006, the construction of the onsite landfill including water treatment system for sediment dewatering in geotubes was completed. The final dredge plan was approved in June 2006. Dredging commenced in September 2006. At the end of October 2007, 413,530 cubic yards of PCB contaminated sediment had been successfully removed from the river. A third example is the Passaic River Phase I Removal, which was completed in 18 months, involving mechanical dredging of approximately 40,000 cubic yards of dioxin contaminated sediment and debris inside a sheet pile wall enclosure with sealed joints, structural reinforcement of an adjacent bulkhead, hydraulic conveyance of dredged material slurry within 1,400 feet of pipeline to a constructed water treatment and sediment processing facility, and transportation/off-site disposal of processed dredged material. Work occurred between July 2011 and January 2013. These case studies demonstrate the appropriateness of a 19-month schedule for Feasibility Study purposes. Actual work schedules are established by the contractor and typically are set at 6 days per week and 10 hours per day. The contractor also will account for repairs and downtime for weather related issues in the overall construction schedule.

2.5.8 Comment: Under Primary Balancing Criteria on Page 34, excavation volume for alternative 6N was listed as 200,100 cubic yards. It appears that it is a typographical error and it should be 152,000 cubic yards.

Response: *Typo noted; the quantities will be clarified in the Record of Decision. The excavation volume for the selected remedy 6N is 162,000 cubic yards reflecting a reduction of the cleanup level to 30 ng/kg.*

2.5.9 Comment: Estimated costs for remedial alternative 3N and 3aN should include present worth cost for repairing cap erosion from weather events expected during the life of the armored cap (the US Army Corps of Engineers Report Evaluation of the San Jacinto Waste Pits Feasibility Study Remediation Alternatives dated August 2016 modeled a potential for an 80% erosional loss during a major storm). Multiple erosional events are possible over centuries so major repairs should be accounted for in the proposed costs associated with these alternatives. Present worth costs for repairing damages to the armored cap due to all projected events are necessary to ensure that adequate funds are available for the life of the armored cap.

Response: *As detailed in the Record of Decision, the cost estimates for the containment alternatives, including Alternatives 3N and 3aN as well as the others, incorporate an annual operation and maintenance cost of $100,000 per year to provide for the costs associated with cap repairs, exposed waste, and repairs of riverbed erosion as has been experienced in the 6 years following completion of the cap, and also to provide for future repairs that may be necessary following hurricanes.*

2.5.11 Comment: Under remedial alternative 4N, the EPA proposed construction of an upgraded armored cap, as described in alternative 3N, over solidified and stabilized waste material. To ensure better containment of waste material, EPA should consider construction of an enhanced armored cap per remedial alternative 3aN, in accordance with the US Army Corps of Engineers recommendations. This change would reflect a change in cost from 3N to 3aN.

Response: *There are a number of environmental conditions that affect the long-term permanence of a cap in the San Jacinto area. Even with the Alternative 3aN design, the principal threat waste and the potential for release of dioxin containing waste is not eliminated as with Alternative 6N. However, an enhanced armor cap in accordance with Alternative 3aN would be appropriate if Alternative 4N had been selected.*

2.5.12 Comment: Under remedial alternative 5N, the EPA proposed construction of an upgraded armored cap, as described in alternative 3N, over the excavated area. To ensure better containment of waste material, please consider construction of an enhanced armored cap per remedial alternative 3aN in accordance with the US Army Corps of Engineers recommendation. Also, please revise the costs to reflect this change from 3N to 3aN.

Response: *There are a number of environmental conditions that affect the long-term permanence of a cap in the San Jacinto area. Even with the Alternative 3aN design, the principal threat waste and the potential for release of dioxin containing waste is not eliminated as with Alternative 6N. However, an enhanced armor cap in accordance with Alternative 3aN would be appropriate if Alternative 5N had been selected.*

2.5.13 Comment: Under remedial alternative 5aN, following the removal of waste material, the EPA proposed covering the waste material removal area with a residuals management layer of clean cover. It is not clear if the excavations would be backfilled prior to placement of the residuals management layer; please clarify.

Response: *Under Alternative 5aN the removed material would not be backfilled and only a residuals management layer would be used to cover the dredge residuals. This will be clarified in the Record of Decision.*